AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph beginning on Page 4, line 4, as follows:

~~Figure 18 illustrates the interactions characterized by the interaction Hamiltonian H_f.~~

~~Figure 19 is an illustration of forward and backward propagating wave trains.~~

~~Figures 20A-C illustrate a single hypothetical run of the excitation field Hamiltonian H_f used to obtain a hypothetical spectrum from the quantum processor.~~

~~Figure 21 shows example hypothetical spectra and the average spectrum after n hypothetical runs of the excitation field H_f~~

Figure 18 illustrates the interactions characterized by the interaction Hamiltonian H_f.

Figures 19A-C illustrate a single hypothetical run of the excitation field Hamiltonian H_f used to obtain a hypothetical spectrum from the quantum processor.

Figure 20 shows example hypothetical spectra and the average spectrum after n hypothetical runs of the excitation field H_f.

Figure 21 is an illustration of forward and backward propagating wave trains.

Please amend the paragraph beginning on Page 34, line 4, as follows:

Figure 11 is an illustration of a quantum processor 304 in Figure 3 having a two-dimensional array of nodes representing one of many possible embodiments of the present invention. The nodes 1102 are chemical polymers linked to adjacent nodes in the lattice via quantum lateral bonds ~~904~~ 1104 and quantum forward bonds 1106. The boundaries 1106 and 1108 provide an insulating barrier to prevent the electric field from leaking out to the surrounding components of the system. The quantum processor also contains a excitation filed 1112 that implements the excitation-field H_f. Located at opposite ends of the quantum processor are reflective plates 1114 and 1116 that reflect the excitation field back onto the lattice of nodes 1102.

Please amend the paragraph beginning on Page 44, line 9, as follows:

Figures 19 and 20 show how a hypothetical quantum processor can be used to obtain an approximation to the function Φ. Figures 19A-C illustrate a single

hypothetical run of the excitation-field Hamiltonian H_f used to obtain a hypothetical spectrum from the quantum processor. In Figure 19A, all of the nodes of the quantum processor 1902 begin in the ground state and can be characterized by the hardware Hamiltonian H_0. The detector 1904 coverts the incident radiation into an electrical current which is used to count the number of photons. In Figure 19B, the excitation-field H_f impinged upon the quantum processor 1802 via the excitation generator 303 in Figure 3. The excited nodes emit light radiation in the form of photons that strike the detector 1904, as indicated by radiating lines 1906, 1908, and 1910. Figure 19C shows a plot of the frequencies along the horizontal axis 1914 and the corresponding intensities along the vertical axis 1916 for the single application of the excitation-field Hamiltonian H_f. The radiating lines 1906, 1908, and 1910 are associated with nodes that emit radiation of the same frequency ν_k and are included in determining the intensity value λ_k. The resulting spectrum intensities $\{\lambda_1, \lambda_2, \ldots\}$ shown in Figure 19C are stored in the coherent memory 306 in Figure 3.